

Stat & Data Analysis

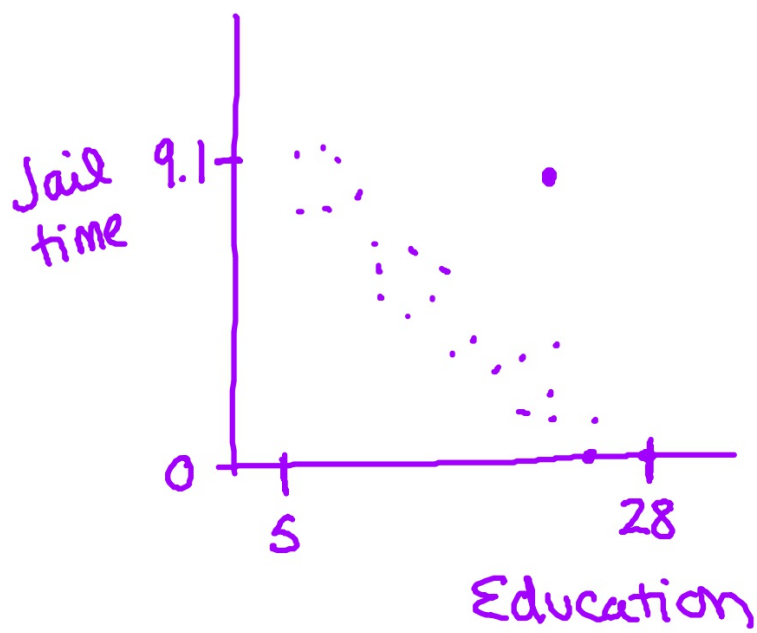
Core Assessment #2 practice 1

Below is data on the years of education (X) versus the years spent in jail (Y) by a sample of 20 – 40 year old men.

Education (Yrs)	Jail Time (Yrs)	Education (Yrs)	Jail Time (Yrs)
24	0	10	5.2
20	2.1	28	0.1
12	5.2	5	8.7
13	3.6	8	8.9
20	0.5	9	7.6
21	1	12	2.3
10	2.2	14	4.5
6	6.5	15	2.1
8	7	17	1.3
10	4	21	0.4
16	2.5	23	0.9
18	1.6	7	9.1

- (a) Create a scatterplot of the data. (1/2 pt)
- (b) Describe the scatterplot. (1/2 pt)
- (c) Are there any outliers in this plot. Identify them if so. (1/2 pt)
- (d) Find the equation of the linear regression (LSR) line and the correlation (r). (1/2 pt)
- (e) Does the correlation (r) agree with your description in part (b)? Why or why not? (1/2 pt)
- (f) Interpret the slope of the LSR line, in context of the problem. (1/2 pt)
- (g) Using your LSR line, predict the jail time for someone with 35 years of education. (1/2 pt)
- (h) Is your prediction in part (g) a good prediction? Why or why not? (1/2 pt)

(A) SCATTERPLOT (1/2 pt)



(b) Describe

- linear
- negative
- strong

(c) No outliers seen

(B) DESCRIBE (1/2 pt)

2^{ND} O

X^{-1}

Diagnostic ON
DONE

r

r^2

(C) OUTLIERS (1/2 pt)

STAT \rightarrow CALC

#8: Lin Reg (a+bx) L1, L2

d) $\hat{y} = 9.5989 - 0.4123(x)$
 $r = -0.8753$ \nwarrow slope

e) yes, it's negative, & strong

~~(D) LSR line and CORRELATION (1/2 pt)~~

- (f) For every 1 increase of years of Education, the jail time decreases by 0.4123 years on average.
- (g) $\hat{y} = 9.5989 - 0.4123(35)$ $x=12$
 $\hat{y} = -4.8316$ years
- (h) No, b/c 35 is an outlier in x-var.

(E) CORRELATION AGREE? (1/2 pt)

(F) INTERPRET THE SLOPE (1/2 pt)


(G) PREDICT FOR 35 YEARS (1/2 pt)

(H) GOOD PREDICTION?? (1/2 pt)

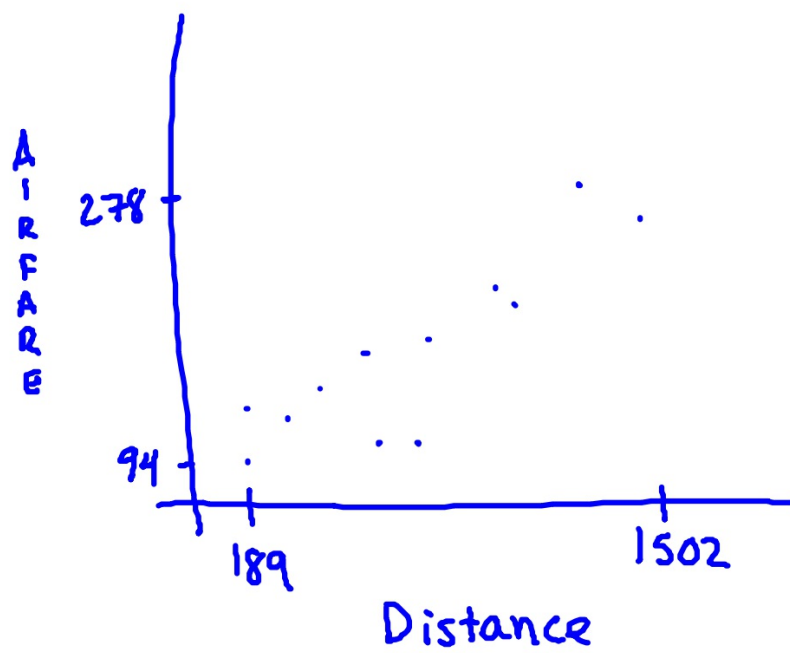
Stat & Data Analysis**Core Assessment #2 practice 2**

Below is a list of distances (X-variable, in miles) and airfares (Y-variable, in dollars) for flights.

Distance	576	370	612	1216	409	1502	946	998	189	787	210	737
Airfare	178	138	94	278	158	258	198	188	98	179	138	98

-  (a) Create a scatterplot of the data. (1/2 pt)
- (b) Describe the scatterplot. (1/2 pt)
- (c) Are there any outliers in this plot? Identify them if so. (1/2 pt)
- (d) Find the equation of the linear regression (LSR) line and the correlation (r). (1/2 pt)
- (e) Does the correlation (r) agree with your description in part (b)? Why or why not? (1/2 pt)
- (f) Interpret the slope of the LSR line, in context of the problem. (1/2 pt)
- (g) Using your LSR line, predict the airfare for a flight of 2000 miles. (1/2 pt)
- (h) Is your prediction in part (g) a good prediction? Why or why not? (1/2 pt)

(A) SCATTERPLOT (1/2 pt)



~~(B) DESCRIBE (1/2 pt)~~

① $\hat{y} = 83.2674 + 0.1174(x)$

$r = 0.795$

② yes it agrees. It's positive & moderately strong.

③ For every increase of 1 mile of distance flown, the airfare increases by \$0.1174.

~~(C) OUTLIERS (1/2 pt)~~

g) $\hat{y} = 83.2674 + 0.1174(2000)$
 $\hat{y} = \$318.0674$

- h) No, it's not a good prediction.
2000 miles is an outlier in
the x-variable.

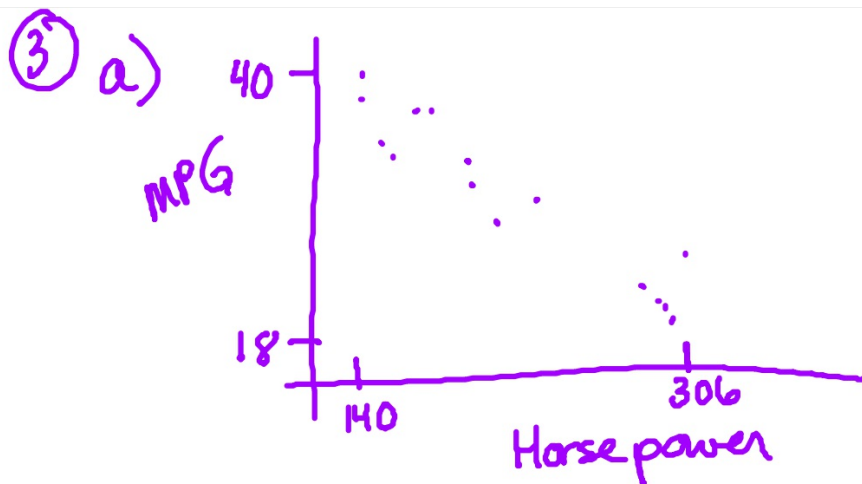
(D) LSR line and CORRELATION (1/2 pt)

(E) CORRELATION AGREE? (1/2 pt)

(F) INTERPRET THE SLOPE (1/2 pt)

(G) PREDICT FOR 2000 MILES (1/2 pt)

(H) GOOD PREDICTION?? (1/2 pt)



⑥ negative,
mod. strong
linear

⑦ no outliers
seen

@(x,y)

d) $\hat{y} = 46.868 - 0.0838(x)$
 $r = -0.8687$

e) yes. It's negative & strong

f) For every 1 increase in horsepower of a car, the gas mileage decreases by 0.0838 mpg.

g) $\hat{y} = 46.868 - 0.0838(375)$
 $\hat{y} = 15.443 \text{ mpg}$

h) No, not a good prediction b/c
375 HP is an outlier in the
X-variable.